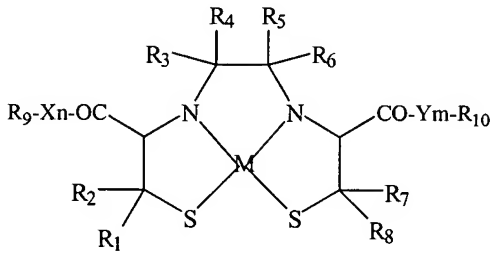
WHAT IS CLAIMED IS:

1. A compound that comprises an N_2S_2 chelate conjugated to a targeting ligand, wherein the targeting ligand is a disease cell cycle targeting compound, a tumor angiogenesis targeting ligand, a tumor apoptosis targeting ligand, a disease receptor targeting ligand, amifostine, angiostatin, monoclonal antibody C225, monoclonal antibody CD31, monoclonal antibody CD40, capecitabine, COX-2, deoxycytidine, fullerene, herceptin, human serum albumin, lactose, luteinizing hormone, pyridoxal, quinazoline, thalidomide, transferrin, or trimethyl lysine.

2. The compound of claim 1, further defined as:



wherein

R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are independently H or CH_3;

R_9 is H, CH_3, a disease cell cycle targeting compound, a tumor angiogenesis targeting ligand, a tumor apoptosis targeting ligand, a disease receptor targeting ligand, amifostine, angiostatin, monoclonal antibody C225, monoclonal antibody CD31, monoclonal antibody CD40, capecitabine, COX-2, deoxycytidine, fullerene, herceptin, human serum albumin, lactose, luteinizing hormone, pyridoxal, quinazoline, thalidomide, transferrin, or trimethyl lysine;

R_{10} is H, CH_3, disease cell cycle targeting compound, a tumor angiogenesis targeting ligand, a tumor apoptosis targeting ligand, a disease receptor targeting ligand,

amifostine, angiostatin, monoclonal antibody C225, monoclonal antibody CD31, monoclonal antibody CD40, capecitabine,COX-2, deoxycytidine, fullerene, herceptin, human serum albumin, lactose, leuteinizing hormone, pyridoxal, quinazoline, thalidomide, transferrin, or trimethyl lysine;

n is 0 or 1;

m is 0 or 1;

X is a water soluble peptide, C_1-C_{20} alkyl, glutamic acid, polyglutamic acid, aspartic acid, polyaspartic acid, bromoethylacetate, ethylenediamine or lysine when n is 1, or a bond when n is 0;

Y is a water soluble peptide, C_1-C_{20} alkyl, glutamic acid, polyglutamic acid, aspartic acid, polyaspartic acid, bromoethylacetate, ethylenediamine or lysine when m is 1, or a bond when m is 0; and

M is ^{99m}Tc, ^{188}Re, ^{186}Re, ^{183}Sm, ^{166}Ho, ^{90}Y, ^{89}Sr, ^{67}Ga, ^{68}Ga, ^{111}In, ^{183}Gd, ^{59}Fe, ^{225}Ac, ^{212}Bi, ^{211}At, ^{45}Ti, ^{60}Cu, ^{61}Cu, ^{67}Cu, ^{64}Cu or ^{62}Cu.

3. The compound of claim 1, wherein the targeting ligand comprises a tumor angiogenesis targeting ligand.

4. The compound of claim 3, wherein the targeting ligand comprises COX-2, anti-EGF receptor, herceptin, angiostatin, or thalidomide.

5. The compound of claim 4, wherein COX-2 is celecoxib, rofecoxib, or etoricoxib.

6. The compound of claim 1, wherein the targeting ligand is a disease cell cycle targeting ligand.

7. The compound of claim 6, wherein the targeting ligand comprises adenosine, , FIAU, FIRU, IVFRU, GCV, PCV, FGCV, FPCV, FHPG, FHBG, or guanine.

8. The compound of claim 1, wherein the targeting ligand comprises a tumor apoptosis targeting ligand.

9. The compound of claim 8, wherein the targeting ligand comprises a TRAIL monoclonal antibody, a substrate of caspase-3, or a Bcl family member.

10. The compound of claim 9, wherein the substrate of caspase-3 is a peptide or polypeptide comprising the amino acid sequence aspartic acid-glutamic acid-valine-aspartic acid.

11. The compound of claim 9, wherein the Bcl family member is Bax, Bcl-xL, Bid, Bad, Bak, or Bcl-2

12. The compound of claim 2, wherein the targeting ligand comprises a disease receptor targeting ligand

13. The compound of claim 12, wherein the targeting ligand comprises an estrogen, an androgen, luteinizing hormone, transferrin, or a progestin.

14. The compound of claim 1, wherein the targeting ligand comprises carnitine or doxorubicin.

15. The compound of claim 1, wherein the targeting ligand comprises guanine or adenosine.

16. The compound of claim 1, wherein the targeting ligand comprises amifostine.

17. The compound of claim 1, wherein the targeting ligand comprises an anti-EGF receptor.

18. The compound of claim 17, wherein the anti-EGF receptor ligand is C225.

19. The compound of claim 1, wherein the targeting ligand comprises monoclonal antibody CD31.

20. The compound of claim 1, wherein the targeting ligand comprises monoclonal antibody CD40.

21. The compound of claim 1, wherein the targeting ligand comprises capecitabine.

22. The compound of claim 1, wherein the targeting ligand comprises deoxycytidine.

23. The compound of claim 1, wherein the targeting ligand comprises fullerene.

24. The compound of claim 1, wherein the targeting ligand comprises human serum albumin.

25. The compound of claim 1, wherein the targeting ligand comprises lactose.

26. The compound of claim 1, wherein the targeting ligand comprises pyridoxal.

27. The compound of claim 1, wherein the targeting ligand comprises quinazoline.

28. The compound of claim 1, wherein the targeting ligand comprises trimethyl lysine.

29. The compound of claim 1, wherein the targeting ligand comprises a disease cell cycle targeting compound.

30. The compound of claim 29, wherein the disease cell cycle targeting compound comprises adenosine, guanine, FIAU, FIRU, IVFRU, GCV, PCV, FGCV, FHPG, or FHBG.

31. The compound of claim 1, wherein the N_2S_2 chelate is further defined as ethylenedicysteine.

32. The compound of claim 1, further comprising a radioactive nuclide.

33. The compound of claim 32, wherein the radioactive nuclide comprises ^{99m}Tc, ^{188}Re, ^{186}Re, ^{183}Sm, ^{166}Ho, ^{90}Y, ^{89}Sr, ^{67}Ga, ^{68}Ga, ^{111}In, ^{183}Gd, ^{59}Fe, ^{225}Ac, ^{212}Bi, ^{211}At, ^{45}Ti, ^{60}Cu, ^{61}Cu, ^{67}Cu, ^{64}Cu or ^{62}Cu.

34. The compound of claim 1, futher comprising a water soluble peptide, C_1-C_{20} alkyl, glutamic acid, polyglutamic acid, aspartic acid, polyaspartic acid, bromoethylacetate, ethylenediamine or lysine positioned between the targeting ligand and the chelate.

35. A method of synthesizing a radiolabeled N_2S_2 chelate conjugated to targeting ligand comprising the steps:

a) obtaining a compound in accordance with claim 1;

b) admixing said compound a radionuclide and a reducing agent to obtain a radionuclide labeled derivative, wherein the N_2S_2 chelate forms a chelate with the radionuclide.

36. The method of claim 35, wherein said reducing agent is a dithionite ion, a stannous ion or a ferrous ion.

37. The method of claim 35, wherein said radionuclide is ^{99m}Tc, ^{188}Re, ^{186}Re, ^{183}Sm, ^{166}Ho, ^{90}Y, ^{89}Sr, ^{67}Ga, ^{68}Ga, ^{111}In, ^{183}Gd, ^{59}Fe, ^{225}Ac, ^{212}Bi, ^{211}At, ^{45}Ti, ^{60}Cu, ^{61}Cu, ^{67}Cu, ^{64}Cu or ^{62}Cu.

38. A method of imaging a site within a mammalian body comprising the steps:

a) administering an effective diagnostic amount of a compound in accordance with claim 32 to said site; and

b) detecting a radioactive signal from said compound localized at a site.

39. The method of claim 38, wherein said site is a tumor.

40. The method of claim 38, wherein said site is an infection.

41. The method of claim 38 wherein said site is breast cancer, ovarian cancer, prostate cancer, endometrium, heart cancer, lung cancer, brain cancer, liver cancer, folate (+) cancer, ER (+) cancer, spleen cancer, pancreas cancer, or intestine cancer.

42. A kit for preparing a radiopharmaceutical preparation comprising:

a) a sealed container including a predetermined quantity of a compound that is a N_2S_2 chelate-targeting ligand conjugate in accordance with claim 1; and

b) a sufficient amount of a reducing agent.

43. The kit of claim 42, further comprising a radionuclide.

44. The kit of claim 43, wherein the radionuclide is ^{99m}Tc, ^{188}Re, ^{186}Re, ^{183}Sm, ^{166}Ho, ^{90}Y, ^{89}Sr, ^{67}Ga, ^{68}Ga, ^{111}In, ^{183}Gd, ^{59}Fe, ^{225}Ac, ^{212}Bi, ^{211}At, ^{45}Ti, ^{60}Cu, ^{61}Cu, ^{67}Cu, ^{64}Cu or ^{62}Cu.

45. The kit of claim 42, further comprising an antioxidant.

46. The kit of claim 45, wherein the antioxidant is vitamin C, tocopherol, pyridoxine, thiamine, or rutin.

47. The kit of claim 46, wherein the antioxidant is vitamin C.

48. The kit of claim 42, further comprising a transition chelator.

49. The kit of claim 48, wherein the transition chelator is glucoheptonate, gluconate, glucarate, citrate, or tartarate.

50. The kit of claim 49, wherein the transition chelator is gluconate or glucarate.

51. The kit of claim 42, wherein the reducing agent is tin (II) chloride or triphenylphosphine.

52. A method of assessing the pharmacology of a agent of interest comprising:

a) preparing an conjugate of the agent to an N_2S_2 chelate;

b) adding a radioactive nuclide to said conjugated chelate to form a radioactive conjugate;

c) administering said radioactive conjugate to a subject; and

d) assessing the pharmacology of the agent.

53. The method of claim 52, wherein the agent of interest is a pharmaceutical agent.

54. The method of claim 52, wherein the N_2S_2 chelate is ethylenedicysteine.

55. The method of claim 52, wherein the subject is a laboratory animal.

56. The method of claim 52, wherein the subject is a human.

57. The method of claim 52, wherein assessing the pharmacology of the agent comprises assessing the biodistribution of the agent.

58. The method of claim 52, wherein assessing the pharmacology of the agent comprises assessing the biostability of the agent.

59. The method of claim 52, wherein assessing the pharmacology of the agent comprises assessing the bioelimination of the agent.